

REMARKS

In response to the Official Action mailed February 28, 2003, Applicants amend their application and request reconsideration. No claims are added or cancelled so that claims 1 and 2 remain pending and under examination.

In this Amendment a number of changes are made to claim 1 to improve its clarity. In addition, the claim is clarified by specifying that the crystalline phases mentioned in the claim are actually monocrystalline, i.e., single crystal, phases. It is apparent from the description in the patent application, particularly with respect to Figures 2 and 3, that this amendment is fully supported by the application as filed. As pointed out at page 8 of the patent application, the structure shown in Figure 3 includes a microstructure 2 composed of aggregations of plural crystalline $\text{Nd}_2\text{Fe}_{14}\text{B}$ structure type phases as well as the amorphous phases 3 and "is different from...the present invention". By contrast, Figure 2 is directed to an embodiment of the invention. It can be seen in Figure 2 that there are no grain boundaries, i.e., no aggregation of plural crystalline phases, in the monocrystalline phases 2 of the $\text{Nd}_2\text{Fe}_{14}\text{B}$ structure type that are disposed between amorphous phases of that material. Amended claim 1 merely describes in words what is shown in the patent application and what is stated at page 8 of the patent application.

Claims 1 and 2 were rejected as anticipated by or, alternatively, as obvious over Araki et al (5,676,998, hereinafter Araki). This rejection is respectfully traversed.

In the Official Action, at page 4, the Examiner stated that the "process limitation recited in the instant product by process claims does not necessarily lend patentability to the claimed product." While the Examiner's position represents a conventional presumption in examining product-by-process claims in the United States, when a process limitation defines the only way a claimed novel product can be made, then defining the product in terms of the process of making is proper and lends patentability to a novel product defined by a product-by-process claim. See *In re Pilkington*, 162 USPQ 145 (CCPA 1969) and MPEP 2173.05 (p). The rationale of *Pilkington* clearly applies here.

The Examiner's attention is directed to the description in the patent application at pages 17-19, heading Seventh Embodiment. This description makes particular reference to Figure 18 of the patent application. That figure indicates a difference in processing that occurs in a known deposition process, like that described in Araki, and the process referred to in claim 1 that defines a structure that is different from the structure produced according to the reference.

In the physical deposition process referred to by the reference, the deposition occurs in a plasma. As well known, a plasma is a complex high temperature environment of ionized and

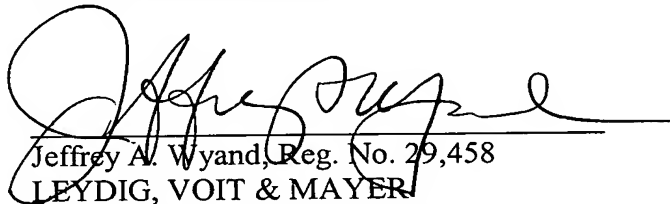
un-ionized particles rapidly moving in many directions. When a substrate is exposed to a plasma in the course of depositing a film on the substrate, as in Araki, although the temperature at the rear side of the substrate is maintained constant, at the front side of the substrate, which is exposed to the plasma, the temperature fluctuates substantially. This temperature fluctuation over time in the conventional, i.e., Araki, process is illustrated by the modulation in temperature shown in Figure 18 of the patent application. As a result of this variation, as described at page 18 at the patent application, the structure produced is the structure shown in Figure 3 of the patent application in which polycrystalline regions, i.e., regions having a microstructure including grain boundaries, are separated from like polycrystalline phases by amorphous phases.

The invention differs from Araki both as to the method employed in producing the structure and in the structure produced. That structure is produced, according to the invention, by controlling the temperature of the front side of the substrate, i.e., the side upon which the magnetic film is being deposited, within a very narrow temperature range, a deviation of no more than 2° from the target temperature. When that temperature control is maintained at the front side of the substrate, then the film deposited includes monocrystalline regions separated by amorphous phase regions of the deposited material. Since the monocrystalline regions have a uniform interior structure, they have a different and superior performance from the magnetic films deposited according to Araki. This difference in structure that is a result of the deposition process is demonstrated by the disclosure of the patent application itself, which is encompassed within the inventors' Declaration filed with the patent application. Essentially, the patent application itself is a Declaration pursuant to 37 CFR 1.132, demonstrating the difference between the structure claimed and the prior art structure, as well as the differences in processing that produces the different structures. The invention is clearly distinct from Araki and is properly claimed in relationship to its method of manufacture.

In Re of ARAKI et al.
Application No. 10/006,679

The foregoing discussion demonstrates that claims 1 and 2, the examined claims, are clearly patentable over Araki. Therefore, upon reconsideration, those claims should be allowed.

Respectfully submitted,



Jeffrey A. Wyand, Reg. No. 29,458

LEYDIG, VOIT & MAYER

700 Thirteenth Street, N.W., Suite 300

Washington, DC 20005-3960

(202) 737-6770 (telephone)

(202) 737-6776 (facsimile)

Date:

May 28, 2003

JAW/tpn